ABC NEWS - STS 2 LAUNCH (11-12-1981)

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From Thursday, November 12th, 1981 ABC NEWS Live coverage of the 2nd space Shuttle Launch with Frank Reynolds

- Crew: Commander: Joe Engle
  Pilot: Dick Truly
- Launched at 10:09:59 A.M E.T

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and reach into space we will in less than 30 minutes now the clock is still running showing 17 minutes and 43 seconds but there will be another built-in hold at about 11 minutes or so before the uh or at 9 41 actually uh so uh we still have some time to wait but the all the indications are is that everything is going just fine and the weather is perfect and all of the last minute checks are proceeding uh appropriately so we're aiming for this 10 am eastern standard time launch joe engel of course the commander of the shuttle columbia is out there on that pad way up at the top we asked him some time ago just what he would be doing at about this time in the countdown and here's what he had to say things are happening so fast the things that we need to check and monitor are are coming so regularly and we're um our concentration is just entirely and totally on monitoring the systems uh making sure and trying to identify any anomaly that may be starting to generate early that there really isn't isn't the time to think about am i going to get scared i think there's a real big desire not to make any mistakes then and that takes your full attention checking and rechecking all of the functions that we'll be doing in the cockpit and we have heard a few exchanges between the spacecraft and launch control and they have been just as uh joe angle indicated gene they're very crisp and business-like they've obviously got things to do and they're just going to go ahead and do it and beneath all that i think joe in his own way is uh saying gee i i just don't want to mess up everyone else is doing their job and you know in a minute i'm going to have to do mine and you have to take everything that is happening right at that moment here's the plane uh piloted by uh john young the commander of the first shuttle it looks to me like he made an approach to the runway that the crew would have to land on and of course we can see the weather is absolutely gorgeous today and uh john can't have

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gorgeous today and uh john can't have anything but good words to say about it go for launch sure he's merely testing out whether they will be able actually to return and of course there are no weather constraints on that well let's go now back to the johnson space center in houston and steve bell steve frank uh astronaut joe allen has been sitting here with me listening in on all the conversations between mission control and the astronauts now on the launch pad and joe i understand we have now passed the first trouble point when we had to uh delay the mission last week uh not last week steve the the very first mission or the first where we couldn't get the backup computer to pay attention to the prime computers and that happened right about this time and uh i'm listening to uh dick report that the backup is listening now to the prime computers and everything's fine let's listen to launch control one safety area is clear the booster test conductor has ordered the gaseous nitrogen purge of the solid rocket booster app skirts to begin and the chase aircraft presently at patrick air force base have been ordered to start their engine a sack of all test support team members have verified that they are go for launch so there's the latest message from mission control and as joe says we are past that point now where on the first space shuttle flight we suddenly started to learn about computers that could have an independent mind if you didn't get to them soon enough and reprogram them we'll be back with more coverage of the launch of the columbia space shuttle after this message and a word from our local stations [Music] and good morning once again you see the countdown clock ticking away at 10

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countdown clock ticking away at 10 minutes and 47 seconds but there is going to be another built-in hold of 10 minutes that's uh planned here you see some of the crowd gathered around waiting and growing uh more anxious i suppose and more excited uh with every passing moment because we're getting to the point now where the astronauts have just been advised about their abort conditions uh they are avoid procedures again in the event that should be necessary well and of course there's a lot of ships and aircraft around the world that are on station if the aircraft spacecraft has to land at different places and of course the crews ejection seats should they have to use them in that case they'd have to land somewhere out there in the water i expect yes they can still get out of the spacecraft in the event that they have to even before launch and uh even very shortly after launch too the access arm is about to be uh taken away or it hasn't been moved already no not yet that's the arm that's the arm that houses a white room everyone's heard about the white room the white room is a is the last piece of solid earth that the crew stands on and that's where they uh they get their good lucks and farewells and their last uh god speed from the from the support crew they can bring that back in a hurry too if they sure can that's one of them like 60 seconds or so yeah yes okay well lyncher has prepared a report on just uh what will happen in the event there is an emergency here on the pad and we'd like to have that report now from lyncher if something goes wrong on the pad before launch making an emergency escape necessary the crew will follow the procedure they've practiced many times some of the drill has been in the trainer so angle and truly could practice getting out of the cockpit vertically or horizontally the rest of the drill has been on the pad itself as described by joe angle we practiced coming out of the vehicle in a contingency situation and escaping from the tower uh getting clear of the tower we've got these uh baskets and slide wires that we are able to get into and

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to get into and and cut the restraining cable and the basket slides down to a personnel carrier that we can then get in and drive clear of the pad the emergency escape training that we have done at the cape just like johnny is one of those things and it's just a big scramble to get out in case you had an emergency we're confident we know how to do it we've practiced it and you know if we had to do it we'd would scramble once the shuttle lifts off the astronauts have less than two minutes to use their ejection seats they're a modified version of air force ejection seats and they're only considered safe up to a hundred thousand feet or about 19 miles in addition military helicopters will be ready to take off to rescue the astronauts they've practiced picking up downed crewmen in the ocean and they've rehearsed a parachute rescue using a mock-up of the orbiter itself in the water they've also simulated a ground landing emergency if the orbiter had to return to the cape after launch practicing removing injured astronauts for treatment at nearby hospitals all right thank you very much lynn it's useful i think to point out that while these procedures aren't necessarily practiced many times and everything has to be anticipated nevertheless we have never had in the history of man space flight in this country an occasion to actually use any of those ejection or emergency procedures have we changed no we haven't uh but we have many backup systems in case the guidance of the booster fails the crew can actually take it over and flat like an airplane from the cockpit we have many other procedures both mechanical and human procedures to keep us from doing what we just saw that is

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[Music] back once again at the kennedy space center we are in a plan to hold in the automatic countdown leading up still though toward a planned launch at 10 a.m eastern time less than 15 minutes from now the crowd is smaller this time but probably just as enthusiastic and here you see some of them at the titusville which is about 13 miles or so away from the launch site and along the banks of the indian river there and our correspondent jack curtis is there with him jack yes frank the excitement is building here among the hundreds of people gathered at titusville which is about 13 miles across the water from launch pad 39a the visibility this morning is not very good the launch pad is barely visible through the haze and of course the crowd is much smaller than we had a week ago partly it's that 31 second what down last week and also the overnight technical problems that contributed to the skepticism as to whether this bird is going to go or not still some people have returned to this exact spot and we'll be talking to some of them a little later frank okay thank you jack there's the beautiful blue sky with only a few scattered clouds above the launch site here at the kennedy space center we're going to go now to the johnson space center in houston and hugh downs hugh yeah frank i think it's interesting why they fire the main engines and get them up to 90 strength for a few seconds before they light these solid rockets they can't turn off the solid rockets once they go and once these engines are lit they're not on center line and the whole thing flexes this is a little bit flexible like a fishing rod it flexes 25 inches under the impact of the firing of these so they have to wait until it sort of springs back and when it's in line again these are lit and then it's centered enough to go and uh and not be uh off its line of ascent in a way this stack the orbit and its tanks and boosters

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the orbit and its tanks and boosters it's a living breathing thing it has metabolism it uh burns fuel it develops temperature it moves and once we know it's also flexible uh we have the feeling that the that it's more living than than anything else frank thank you hugh it is indeed more living than anything else as you said well we are still in the uh planned hold at uh t minus nine but uh in about uh a minute or so they will pick up the count and we're headed toward a 10 a.m scheduled liftoff now there are quite a few things to watch during the launch at very important events that will take place and jules bergman has prepared this report on exactly what takes place when the command is given the engine start and columbia begins its journey t-minus nine minutes the count resumed the launch director has now made the decision to go for launch t-minus seven minutes the crew access arm is retracted now the only method of immediate escape for the crew is by using the ejection seats t-minus five minutes the electronic safety pins are pulled the solid rocket boosters can now be ignited range safety now has control of explosives which could destroy the shuttle if its flight path were to endanger people t-minus 2 minutes and 55 seconds the orbiter is now on internal power final pressurization of the external fuel tank begins the beanie-like vent cap is retracted t-minus 28 seconds the orbiter's computers take control of the countdown all five computers must be operating synchronously for the countdown to continue t-minus seven seconds the shuttle's three main engines ignite one after the other by t-minus three seconds the main engines must achieve ninety percent of their power t-minus zero the moment of truth simultaneously the hold down bolts are blown as the solid rocket boosters are

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blown as the solid rocket boosters are ignited three tenths of a second later we have liftoff with the shuttle clearing the tower at 6.8 seconds one half second later the roll and pitch program begin the maneuver necessary to put the boosters in columbia in the right attitudes for orbit t plus 43 seconds the shuttle's main engines are throttled down just prior to the point where columbia faces its maximum g forces 19 seconds later the shuttle resumes full power t plus two minutes seven seconds the solid rocket boosters burn out and separate from the shuttle now the columbia's main engines are on their own for the final push to orbit columbia is now steering for his precise window in space for main engine cut off all right that was a recorded report by jules bergman uh to tell you what to look for during the launch sequence this is a live shot we don't want to mislead you the the shuttle hasn't gone yet but uh every uh indicator is that it will go here's a shot from way across the indian river across the beautiful blue waters there is does seem to be a little bit of haze but boy there is certainly none evident out here from our vantage point and the countdown is expected to be resumed very shortly now gene i believe some of those events uh that uh jews are reporting on particularly all the way up through solid rocket booster uh we ought to be able to see today with the naked eye and certainly with the television camera jules uh what kind of a view do you have out there is there a bit of miss between you and the uh launch pad uh frank that's a no uh the the mr hayes jack curtis has is because of a river uh the banana river in the indian river in indian river lying between titusville and the launch pad it's clear as a clear as a bell lunch director george page asked for a slight delay in picking up the countdown at this point while he checked a couple of things which he heard during the countdown he had just checked with the range safety officer to determine

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safety officer to determine that a uh steady drop out of the main carrier uh wave that is used by the rain safety people uh is not serious and that a backup carrier signal uh is satisfactory he is also checking on several other things and we will get back to you as soon as a determination has been made to pick up the countdown this is shuttle launch control all right gene uh so they have not resumed the countdown as planned uh at the uh appropriate time uh what uh what precisely do you suppose is the difference frank i don't interpret that as being anything serious george page the test conductor again has seen a few little questions he has there's no problem in extending this hold an extra minute or two or three we're we're in a very appropriate point to pick up the count at t minus nine minutes and perhaps we may go at 1005 or 1003 or 1007 but the test conductor wants to make sure this is a test program it's not just a test program in space but it's a test program uh from the ground on up and he's part of that test program he just wants to make sure that everything that can be done on the ground to alleviate any problems at all is going to be taken care of okay let's see if we can get some more information about this now from uh steve bell and joe allen who are at the johnson uh space center in houston steve frank we're sitting here listening in on these messages just as you are and uh trying to interpret them joe how do you assess what's uh just been told us steve it sounds like it's a problem in florida it has to do with people that follow the spacecraft outbound make sure it's in good healthy state and for some reason they've lost a radar or something i'm unsure as to what's happening but could this uh conceivably hold things up for a long time i i it's conceivable i i think they'll fix it fairly quickly there's several methods to track it and we'll see what happens and as we've just been pointing out we are in a situation where everybody will take that extra minute to do that extra check it's not critical right now if you

00:16:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=960s)

check it's not critical right now if you fall 10 20 minutes how long do we have this morning we have uh certainly over an hour i would guess about two hours so indeed that's the reason for the hole we have a choice of picking it up so we can we can wait and be a little patient for a few minutes here okay now you've been through all this in the simulators you're looking forward to a mission in the future where it'll be your baby what is an astronaut thinking about when you suddenly hear something like this the countdown doesn't resume are you really busy or do you have time to think about what's ahead well i think joe engel said it well last time he when heard some bad news he said take your time and get it right i'm sure that's what they're thinking right now but you're not as busy and if things are on hold you're more or less on hold too aren't you voice of shuttle control checked on a number of problems which had come up during the countdown to determine that there are no constraints at the present time he has spoken to the launch crew and says let's take our time it's been a hard one watch all your data but we're going to do it right uh he has uh spoken to the uh the crew and he's uh to joe engel and today truly and said we're going to give you a good one we're in the process now of the test conductor going over the whole criteria with the launch team to let them know what points holds can be called and what the proper procedure is to call that hold uh launch director george page has told the launch team to take their time and do it right we're standing by now to get word of the point at which we will be picking up at the t-minus nine minutes points this is shuttle launch control well all right we're just gonna have to wait there that way frank what you're seeing here i believe is probably the highest degree of uh professionalism that we can see

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professionalism that we can see exhibited because we're not just on an adventure here this is a program that has so uh so many far-reaching effects uh not just for the two guys on top not just for a few of us looking at this launch but for this country and for the future and and for where we're going well when george says let's do it if we're going to do it uh at all let's do it right i think uh he is looking forward to the significance of what this vehicle means to the future of this country yes but at the same time gene i have to point out that all we've heard all morning long now you know has been everything is going just fine everything is uh perfect and uh no difficulties uh bermuda tracking station that was straightened out and so forth the weather is fine and uh here we are at nine minutes now before the launch and all of a sudden we learn that they are not resuming the countdown it doesn't necessarily mean that anything is wrong but i think there can be a few uh intakes of breath around the country when uh you know it comes as sort of a surprise well those things that are uh how did they discover these difficulties well they may have very well discovered them uh two or three or four hours ago and this happens to be appropriate time to take a deep breath and take a good look at all those final final aspects those final checks is final things that perhaps were not just right maybe four and five hours ago when they weren't that important they are important now well yes okay thank you gene well we're in the uh hold the clock has stopped and uh we await a decision on when to start it and when it does there will be nine minutes to go before launch there you see the people at titusville about 13 miles away still peering across the river to try to get a shot of what is taking place and there is not much to watch at the moment because nothing is happening but uh we expect that we will be able to go uh shortly after 10 o'clock well our coverage of space shuttle columbia will continue in a moment [Music] the shuttle's three main engines create enough energy to light new york's manhattan island for

[00:20:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=1200s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=1200s)

to light new york's manhattan island for seven minutes back once again at the kennedy space center and you see that the clock is stopped the counter has been uh held but we have just received word from launch control that they plan to start it again in probably about a minute or so and that means that we're aiming for a launch now at 10 10 eastern time so uh whatever problems or difficulties or uncertainties that caused them to bring about this brief delay in the uh countdown procedure extending the hold actually gene is all they did they apparently now have uh resolved all those problems and checked everybody out and everybody says go so we're going to go and the clock is going to start running again very very shortly now while we're waiting uh because uh nothing much is really going to happen except that that clock is going to start moving it might be useful to uh remind you that uh these two men are going to live together in very crowded quarters and they've got to be uh pretty good friends and cooperative with one another so how do they feel about one another well we asked dick truly some time ago what uh what kind of a fellow joe angle really is and this is what he had to say here's truly joe is uh probably one of the most natural uh pilots that i've ever met or flown with he flying to him is uh is a real love he's uh just about as good a pilot as i've ever seen and so his main strengths are are really his uh i think or his interest in the flying of the spacecraft he's uh very strong all right the clock has started once again they picked up the countdown and now at eight minutes and 40 seconds or so before the liftoff

[00:22:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=1320s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=1320s)

or so before the liftoff it might be uh worthwhile of course since we've already heard from dick truly about uh joe engel um i was going to say we were going to hear what engel has to say about truly and we will in just a moment but uh we're getting close now this is the uh this is the white knuckle time gene isn't it let's hear what uh engel has to say about trump first of all he's a super human being i uh dick and i get along famously together we've been assigned as a crew now for six or seven years and and that's a long time to work uh terribly close and terribly intimately with somebody literally all the time i mean seven days a week sometimes and i consider it a real privilege to have gotten to be assigned on a crew with dick he's very knowledgeable about particularly the software and the computer aspect of the vehicle and i and i i lean and rely very heavily on him too to carry that load as far as task sharing and task assignment on the vehicle all right that was uh joe engel talking about his colleague richard truly and you see the clock here seven minutes and 30 seconds and counting and at seven minutes they will retract the access arm is that right gene it's uh getting pretty close to the as we say to the white knuckle time yeah certainly you know dick and joe truly are good friends uh unlike perhaps uh what people think here we are seven minutes and 14. there's a view of the hatch the hatch is closed and buttoned up and the white room will be that arm you see there containing the white room will begin to swing back away from and there goes retraction of the crew access arm this is the walkway attached to the service structure and used by the crew to walk across to the orbiter this is a view from that access arm a camera in the access arm as we see it retract away from the uh shuttle columbia

[00:24:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=1440s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=1440s)

the crew has been advised to lower their helmet visors and at t minus six minutes we'll begin preparations for starting of the auxiliary power units the apu's are turbine devices fueled by decomposing hydrazine liquid which provides hydraulic power to change the angle of the engine to operate the aerodynamic surfaces engine valves and during landing operate the landing gear coming up on the t minus six minute point in our countdown the pilot dick truly has begun the apu pre-start activities and it is complete the development fight instrumentation which measures stretches on the orbiter during fight have been turned on recorder stop off for playback after landing in 45 seconds we will start the apu's and if you remember of course this is what kept us from going uh the last last week jules are you ready for launch sure am frank i've been uh a long time coming yes you uh you and gene realize of course that all this is happening on automatic computers uh the gls or ground launch sequencer and shortly uh when the apus or auxiliary power units ignite the five on-board computers as well take over in fact they become the lead computers and the gls of the ground computer follows and checks them out we're coming up on the t minus we see the access arm the white room is completely retracted now the you might sort of look at it as the crew is really self-contrained in their home for the next five days okay they've started now in the apu the apu's we should see a little exhaust gas i don't know if we can see it from this distance as it comes out the trailing edge of the or the bottom edge of the

[00:26:03 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=1563s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=1563s)

yes there it is see that was i believe dick truly commenting about the start of the april these chase planes can't chase the shuttle too far but they're valuable because apu started completely complete yes that was the voice of dick truly uh confirming his start at the apu those apus are used for the hydraulic system again to drive the uh the engines the gambling of the movement of the big engines during launch and all the the control surfaces during the landing minus four minutes they are actually not purge of the main engines on the orbiter t minus three minutes fifty seconds and counting frank you can feel a change in the atmosphere can't you sure minus three minutes 45 seconds the yellow bond speed break and rudder are being moved through a pre-programmed pattern to ensure that they'll be ready to be used in flight little exhaust from the apu is coming out detail of the orbiter indicating that all is well t minus three minutes 28 seconds and counting the shuttle is now on internal power however the fuel cells are still receiving their fuel from the ground support system through the tail service mask for one more minute t minus three minutes 15 seconds the profile checks of the arrow surfaces have been completed and checked t-minus three minutes five seconds the engine gimbal or movement check is underway to assure that they're ready for flight control the t-minus valve on the external tank has been closed and pressurization begun after the tank is pressurized the whole capability is limited t-minus two minutes 40 seconds we have cleared the caution

[00:28:01 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=1681s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=1681s)

40 seconds we have cleared the caution and warning memory the gaseous oxygen bent arm is thus being retracted t minus 2 minutes 30 seconds and counting the fuel cell ground supply of oxygen and hydrogen has been terminated and the vehicle is on its onboard supply t minus two minutes 15 seconds the main engines have the gimbal to their start position and the pressure on the liquid oxygen tank is at slight pressure coming up test pilot's dream it's a long wait for them the liquid hydrogen vent valve has been closed and flight pressurization underwear t-minus 1 minutes 50 seconds and counting the vehicle is truly on its own arm is almost fully retracted t minus one minute forty seconds and counting it is alive you can you can feel it frank

it's just it's like that that the bird is breathing one minute thirty minutes ninety seconds away from launch of sps2 they never do get routine one minute 15 seconds and everything going smoothly t-minus one minute and counting and we're really going to do it today there's an electricity in the air here that was missing last wednesday the firing system for the ground suppression water is armed let's get past 31 seconds you will go through 31 seconds like uh sherman went to minus 40 liners

00:30:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=1800s)

sherman went to minus 40 liners development flight instrument recorders are on t minus 37 seconds we're about just a few seconds away from switching control of launch to the computer we did it frankly we have on the way here countdown now being conducted by the launch sequencers onboard the orbiter t minus 20 seconds and counting the srb hydraulic power units have started the srp nozzles have been moved to start position coming up on ten t minus ten nine we have go for main engine start there we go [Music] god that's great 25 seconds rolling over completed 30 seconds columbia now one nautical mile in altitude 35 seconds status [Music] maximum aerodynamic pressure on the vehicle we should see him pitching over now uh altitude three nautical miles down the range watching our reading in another minute

00:32:07 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=1927s)

[Music] this shot coming and they went together they're going nearly 25 seconds onboard guys columbia external tank [Music] that's the voice of joe angle mark three minutes eight seconds columbia now 46 nautical miles in altitude 66 nautical miles downrange columbia's three main engines continue to run smoothly engel is truly really moving out now velocity now reading 6 700 feet per

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velocity now reading 6 700 feet per second get past the four-minute mark is an important point too four minutes is when they no longer have to abort back here in case they shut down then they're on their way march three minutes thirty seconds columbia up 52 nautical miles in altitude 85 nautical miles downrange velocity now reading 7 000 feet per second return status check in the mission controlled by flight director neil hutchinson engel is truly given a goal to continue how's that for a birthday present for dick truly yes that's great coming up on four minutes into the mission now nautical miles down the range velocity region 7900 feet per second four minutes eight seconds uh standing by for a negative return and pressed ato call-ups by capcom brandenstein all right here's a playback now of the launch moment of ignition [Music] for the first time colombia has uh forwarded abort to orbit capability on two engines by throwing the engines up to 100 percent that means they can lose one of the three engines and still get in orbit by utilizing their fuel through the remaining two five minutes columbia 68 nautical miles altitude

00:36:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=2160s)

[Music] i could do it again well what was the birthday card to uh dick truly have a blast on your birthday he certainly had one no i mean all right we're at five minutes 45 seconds into the mission and they're pressing on toward orbit and that spacecraft has been there before it is really returned to space i'm going to show you the launch from still another angle i guess we've got cameras scattered all over this place majestic [Music] just a tremendous thrust and power we have about two more minutes before the main engines uh shut off which achieves am i a low orbital velocity now reading uh 14 900 feet per second they're really hauling the mail today yes they're going the main engines uh shut down at uh eight minutes and 40 seconds into the mission and we're at six minutes and 50 seconds right now this is animation now we've no longer had no longer have they're about 75 miles high above the surface of the earth and they're still pitched upward uh gaining speed and gaining altitude at this time and they're more than 800 miles away

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and they're more than 800 miles away that report says that england truly can achieve uh normal engine cut-off targets even if two engines go out the further they get the 20 seconds the safer they are that's right well the more sure they are getting it over but that's a real key here now we have about another minute to go before those main engines do shut down and then we'll separate from that big storage or fuel tank [Music] three g's there's three nautical miles in but that's well within our ability to uh to fly the spacecraft eight minutes just because they've had a chance to look out the window oh you betcha they are seconds before main engine cut off columbia now 63 nautical miles now to 645 nautical miles downrange velocity now reading 24 000 feet per second they lift here at 10 o'clock it's probably about one or two o'clock in the afternoon where they are right now eight minutes 28 seconds standing by now for main engine cutoff standby this is critical colombia now returned to space not yet returned orbit standing by now for external tank separation love you houston you can ignore the imu bite it is in space but it's not in an orbit that can sustain itself it still has to burn at smaller energy 58 seconds confirm external tank separation columbia big tank is gone another outperforming evasive maneuver moving below and beyond the external tank now colombia is alone right well there's a few of us up there with 10 minutes 15 seconds status check emission control for the first domes burn

[00:40:01 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=2401s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=2401s)

first domes burn his arms is an orbiting maneuvering rocket system they have to increase energy and it's also the rockets they burn to come back to space when they slow down columbia houston uh your goal for nominal homes one and brave do you shut down on time seconds a columbia now maneuvering homes one burn attitude using the two six thousand pound thrust engines holmes one will be posi grade moving colombia forward and higher on her flight path placing colombia in orbit posit grade of course is in the direction of the orbit it adds energy to the orbit it brings up their altitude uh very so ever slowly we're convinced those imu or software bites right at miko no problem that's a communication from the spacecraft steve bell and joe allen are at the johnson space center in houston texas where mission control is located and where they are now uh monitoring and directing and guiding this mission we have another burn coming up pretty soon steve yes i think uh we have an olmsburn coming up right here don't we joe steve it's burning right now i think okay and that is the final maneuvering of the rockets to put it into the orb that we want how soon do we know exactly where we're going to be both homes look good going over the hill we're about to lose contact with the spacecraft but the engines were burning properly when it uh went below the horizon of our tracking antennas on the ground and we'll see them next uh as they come over spain

[00:42:01 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=2521s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=2521s)

over spain but when we know that the olms berms were proper that we've got it under the uh direct position to make the full five-day mission when they check back at spain we'll know right away we have to do another burn later on but uh the olms engines have tested out properly once again and i think there's going to be no problem i want to tell everybody that there was one very excited astronaut here as we watched that lift on all of us were excited but to know down to the precise second exactly what's supposed to be happening and listening in on it all at the same time have you heard anything from all the transmissions between to acquire uh spaceship aircraft and ground control that would indicate any kind of problem we've just lost the signal here at madrid the spacecraft is beyond the horizon we had an extended time of coverage and uh saw the ohm's engine cut off for the first ohms burn all right the loss of signal uh will uh stay in effect until the spacecraft comes within range of the tracking station at madrid and that won't be very long from now as we pointed out they have already made the burn to place them in preliminary orbit and then i guess uh some 42 minutes into the mission they will make the second burn to put them in their regular orbit about 157 miles or so above the earth david hartman the host of good morning america has been here all morning watching it david what did you think i'm sitting with jim mcdivitt and harrison schmidt they've been up on top of these rockets before they said it would be it would be exciting it was all right i must tell you i just i don't know how to do it you're telling her we will i thought we were going to lose him well i was just shaking it is just so beyond anything that anybody can comprehend at least for me to comprehend and you can't imagine you guys told me it would be unlike anything that i've ever experienced and that's the

[00:44:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=2640s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=2640s)

experienced and that's the understatement of all time that was so much more than i could even imagine this is a lot more like a saturn v launch and it must have been the atmospheric conditions uh that dampened some of the uh sound and pressures that uh one feels with the saturn v during the first sts-1 launch right the first time the shuttle went off this time you got that heavy low frequency sound you got the crackle as it uh got up higher it's just a super i thought i was going to jump off the platform we had to hold him down i must say i recommend it to all of you who would like an experience of a lifetime this is one of them this is really something thank god it went well thank god they're all right next step david you're going to have to go let's show you what i'm really so excited about here it is again this is a replay now of the launch that took place uh 14 minutes ago approximately and what a truly odd sparring sight it is and frank uh up she goes it looks easy the feel appreciates david's excitement enthusiasm but if i may i would like to say you exhibited just a little bit of that excitement enthusiasm yourself if abc ever decides to put put a shuttle in space i think you and david ought to be the prime crew oh boy i don't know you better have somebody else along the steer gene this is where jim and i had to grab david okay thank you all gentlemen as we watch a replay of columbia soaring into space we'll pause for a moment our coverage of the space shuttle columbia continues in a moment reach into space abc news live coverage of the space shuttle columbia continues now from the kennedy space center in florida frank reynolds now empty pad there is the now empty pad launch pad 39a here at the kennedy space center a moment ago we saw a bird just

[00:46:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=2760s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=2760s)

saw a bird just wheeling in a sort of tranquil way around the uh space pad or the launch pad the mission is now 17 minutes and 10 seconds or so underway and the astronauts while they soar above uh they're out over the atlantic well over the atlantic approaching actually the madrid tracking station uh while they do just roar off into space actually they go into orbit in a series of sort of steps don't they gene yes the uh the main engine puts them into a an orb into space effectively but not into an orbit around the earth that they could sustain sustain themselves so there's a series of uh burns as they say engine firings really that just move them right on up to where they finally want to be and will stay for the uh for the full five days each they have small rocket engines they just put a little bit more energy into the orbit and so slowly increase its size until they get it to the point where they want it in this case it's going to be about 150 statute miles circular above the earth yes okay let's go down to uh houston now to uh mission control or to the johnson space center and uh steve bell steve thank you frank i'm sitting here with uh joe allen one of the shuttle astronauts joe you've been monitoring the mission control line with the astronauts ever since liftoff you've got a clock running right to the second here have we heard anything in the communications that would indicate anything other than perfect so far no it it sounds uh sounds beautiful they did have one new what i'd call a nuisance alarm uh with a a computer program that's called a built-in test equipment they call it bite and you may have heard the capcom say ignore the bite message uh it's it's nothing all right in other words the astronauts were getting a message might be a problem they got a message that the inertial measurement units were acting a bit funny but have been since told to ignore that all right what's going on we know that houston houston control is now in charge of the mission uh what exactly are they doing to i mean is this all pre-programmed all computerized or

[00:48:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=2880s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=2880s)

pre-programmed all computerized or are men actually making the uh shuttle do what it's doing if it does exactly as it's instructed to do it is pre-programmed mission control is there to watch that that happens and really is not all that busy until it starts to deviate from that free plan primarily a monitoring function at this point yes how about aboard the spacecraft itself where you've got two astronauts are there is there is a monitoring mode uh it is to a degree although they have tasks to carry out now they they have to shut down the apu's the things we heard so much about in the last few days they ran the required few minutes time ran beautifully they're also shutting down uh the or cleaning up the big engines making sure all the leftover propellant is dumped out the back end of those engines that's done manually it's it's done using switches yes all right so they're getting ready now for what will be their first major assignment uh as pilots or as on-board operators uh really as as you said earlier to open the payload bay doors to uh first of all make sure the computers are instructed with the on orbit instructions uh and properly configured for their stay in orbit and then to open the doors what are they thinking by now that first look at space well they're bus they're busy they're probably not looking out all that much at the moment but they'll have plenty of time later on yes thank you very much joe now back to uh frank reynolds at the cave okay steve thank you uh yes we just have had an indication that uh something was fourteen percent high i missed part of that well one of their auxiliary power units that we've heard so much about uh they're about ready to shut them down but the temperature got high on the number three unit a little early and as joe did or excuse me as dick truly did he monitored he made a decision on board to shut that number three unit down about uh 10 or 20 seconds early appears to be no problem yes it uh it is important of course because they need it don't they in order to get back down well i've got three of them in there there's three for a purpose any two could fail and they could still activate the body flaps and control surfaces and the

00:50:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3000s)

flaps and control surfaces and the landing gear to get back home well this mission of course will be notable because uh there will be uh something uh very important uh attempted or demonstrated during this mission the ability to not only open the doors but actually to use the arm the canada arm it's called and there you see an animation of it it is sort of a long 50 foot uh metal arm it has a shoulder an elbow a wrist and a hand of several uh wire type contraptions that actually are able to grasp certain objects in space or to lift objects from the uh cargo bay out into space so uh that will be tested this time they won't actually do any grabbing or any lifting but they will open the uh the cargo bay doors and extend the uh the arm out to see how it works lynn sure has prepared a report on just how important that is it comes to us from canada oh i'm sorry she hasn't prepared a report she's standing right there now with a man who's had a great deal to do with it and she's on live go ahead lynn thanks frank i am here with uh john roberts he is the minister for science and technology from canada and he is the man who's been responsible for getting this arm made in canada mr roberts what are you going to be doing tomorrow somewhere between 7 and 8 a.m i'm going to be watching on television when the canada arm the remote manipulator system is unsheathed and used on the shuttle for the first time could we say that you're going to be watching with a little anxiety and a little bit of pride what do you think the feelings are going to be mainly pride slightly cross figures to make sure everything goes all right it's met the specifications so we know it's okay but there's still a bit of doubt as to how the vibration of takeoff may affect it but we're pretty sure it'll be okay you are then confident that every that there will be no need to jettison at the end that everything will work all right with it 99 and 44 100 sure dick truly said one of the things he was looking forward to uh was operating that arm in near zero gravity out in space because it's been very different here on earth he said it would be fun do you think i'll have fun with it i think it'll be a little bit like a kid with an erector set that magnificent arm will be out there

00:52:01 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3121s)

that magnificent arm will be out there television cameras will be attached to it be able to look at the outside skin of the spacecraft check the tiles i think it's going to be a wonderful morning what have been your thoughts during this uh the the one week scrub and then today we didn't quite know there towards the end did you have some anxiety well it heightens the excitement i guess adds a little bit of tension to it did you ever think that the shuttle might not be able to take off because of the weight of the arm that had been brought up no the arm weighs about 900 pounds it can lift the whole uh railway boxcar weight once it's in space but i don't think that the weight of the arm is a has has ever been a great uh problem no no worries on that on that score politically what does this do to u.s canadian relations having that arm going up in this craft oh i think it's a help there there are two things are really important to us about this one is the use of canadian technology the world's best and this kind of thing and secondly it's an example of cooperation between two countries in the space field and i think that that's an important thing too i hope it strengthens canadian american relations they're pretty strong already strengthens them further well tomorrow morning good luck to you good luck to the arm thank you very much okay thanks mr roberts frank thank you lynn it's a 100 million dollar arm and the canadians have given it to us this time around although i understand that nasa is going to pay for the others that will come up here's a replay of the launch that took place 24 minutes and uh 20 seconds ago those of you who missed it this is a recording a replay of the launch an absolutely flawless launch too watch the uh rollover now frank this uh this launch is actually governed uh by computers onboard a spacecraft although the astronauts can take over manually if they have to contrary to a broad misconception that exists even during uh germany and apollo the astronauts are not passengers once they get in orbit they they are the controllers of the spacecraft uh they're assisted greatly by uh by the information from houston but they are truly pilots of that spacecraft well we had some spectacular shots and here now is the map of uh the astronauts are in orbit and they're passing over

[00:54:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3240s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3240s)

they're passing over it appears to be algeria they'll be going over libya the sudan and ethiopia very shortly and we'll continue with our coverage of the flight of the space shuttle after this message and a word from our local stations stay with channel 7 and be an eyewitness to history reach into space abc news live coverage of the space shuttle columbia continues from the kennedy space center in florida frank reynolds and good morning once again well the garage has been empty for about uh 28 and a half minutes the bird has flown and flies she did as colombia lifted off at about 10 10 eastern time this morning we want to show you those of you who may have missed it on those of you who'd like to see it again another replay of the launch from the moment of ignition when that great flame and smoke burst out and here it is from the other direction here's the liquid rockets they're up to speed there comes solid rockets and she's on the way you know that's an exciting moment it sure doesn't wait from ignition to clearing the tower is only about six seconds or so six and a half seconds and that's a very critical time and follow our members took us over 15 seconds and although we had a more powerful engine we moved around much more slow and it always seemed to wobble you know i can tell they fall we're gonna get up there yeah almost almost looks sometimes like it would fall over you don't get the chance uh with this one because it moves out so quickly but this is a it's a totally different configuration and that's why it's so different to see it uh lifting off that way you know with the solid rocket boosters and of course that huge external tank that it's all made it to

[00:56:01 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3361s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3361s)

external tank that it's all made it to it's it's more the kind of thing we're familiar with seeing airplanes and we're beginning to see something i think all of us out there seen something we can more closely identify with apollo a long big booster with something from outer space now i think everyone can associate with with the shuttle far more closely than they could with with apollo and we'll see it come down of course uh on tuesday out there in the desert in california at edwards air force base where so many of these pilots have spent so many years training and working so very hard to prepare themselves for missions like this and it was from edwards i guess too that joe angle actually flew the x-15 wasn't it joe's been in space uh 16 times so he has his astronaut wings but i'll tell you he's he's re-earning his wings out there today well i guess since i mentioned edwards air force base uh naturally uh we're going to have a quick look at edwards air force base where we saw a couple of hours ago a truly spectacular dawn over the desert looks pretty good there right now doesn't it uh gene well let's hope they don't have to use that landing site out there for a few days but it sure is a pretty day ken kashuahara correspondent at edwards has been standing by just in the event it would have been necessary for colombia to land at edwards and they did have that capability but ken you're not going to see any shuttle uh landing today uh we hope not frank and we hope it'll be next tuesday if all goes according to schedule as you saw it's a beautiful day out here the the weather forecast for this morning at least is is fine just a few scattered clouds up above as you saw but one thing that concerns the weather people here is is the weather there's a storm sitting up off the pacific and in fact it's over northern california now and about six hours from now uh this entire sky out here is expected to be covered by clouds nasa officials here were worried that the further into november we get the more likely we would have a possibility rather for a storm coming in right now the long range forecast although it's not exactly accurate calls for clear weather on tuesday for the scheduled landing of the of the shuttle everybody here is ready

[00:58:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3480s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3480s)

of the shuttle everybody here is ready and as you mentioned uh um this is where joe angle trained and people here very excited about that or many of them having known him back then the train the chase planes as you saw are ready the convoy has been standing by for some hours and is is still out on the lake bed in the event that the shuttle had to come down here for some reason or other today everybody is ready all of the rehearsals are completed and this time they are hoping to refine their procedures once the shuttle comes to a stop here and get the astronauts out in about 27 minutes as opposed to more than an hour last time frank all right thank you ken and we'll see you out there uh on monday actually i guess we're going out on sunday i'm coming out sunday and uh be there on monday and tuesday for the uh for the landing which of course is spectacular in its own way to see that bird come down and realize where it's been zooming around and around and around right now the uh the spacecraft is over africa and will enter darkness as i understand it over the indian ocean i'll be able to see the earth in darkness frank we have to wait for our day to end for uh noon time to come and the sun progressed to the west but for joe and dick today they're going seeking their own nighttime uh they're probably uh four or five o'clock in the afternoon right now in in their day because that's a time zone over the earth they're on when they first get in orbit uh they're it's almost like high noon over the atlantic and they're looking at a very reflective ocean very bright ocean and of course they can see a fantastic beautiful curvature of the earth the horizon and the next thing i i'm just trying to project their feelings uh they'll see his land for the first time again since they left home and they'll see the coast of uh of africa and that truly will be an exhilarating experience for them and then uh generally there's no clouds over africa over northern africa the desert and i can see the ajax mountains the sahara deserts the things that are so vast that we read about history books when we're kids they're going to be 130 150 miles above the earth looking at the entirety of that

[01:00:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3600s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3600s)

looking at the entirety of that continent and it's it's going to be i'm excited for them they have a continent wide view don't they yes yes and tell me gene if i may ask how uh how easy is it to identify given clear conditions how easy is it to identify things like for example gibraltar uh you see that yes you can it's easy because they study their landmarks they study the topography and the geography of the the this earth and uh one thing though it's it's very difficult to get lost in space and by that i mean if you if you can identify a known landmark you can progress to another one up a mouth over up the mississippi river you can find them places along the mississippi uh you can find even cities st louis and what have you could you spot cities really oh yeah yes you can but when you first look down uh at some of these landmarks unless they're prominent like gibraltar or like the peninsula floor this kind of thing you have to find your way you have to sort of sort of find where you are visually uh down there and then you can work your way up and you say there's like okeechobee or or there's perhaps uh the china wall which some of us have seen from space the wall itself yes you were able to identify you can track the shadow if the sun is right if the sun is right you can track the shadow but you have to have some landmarks which to work your way along on the surface of the earth thank you genie that's fascinating well they're doing a lot of tracking at the johnson space center in houston and we're going to go there now to steve bell steve frank uh what hasn't got a lot of attention publicly at least is that when the first of the space shuttle flights went up the trajectory was not what the computers had said it would be it was all right it just wasn't what they had expected and so the officials here at mission control were watching very carefully today to see what the chain was going to be astronaut joe allen sitting with me joe what happened what happened steve as best i understand it was nothing today it went right up the mathematical trajectory we called it the last time lofting and uh the capcom told john young and bob crippen you're lofting during the first ascent of this space shut up but

[01:02:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3720s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3720s)

shut up but it went steeper today it went right up uh the trajectory as expected and i suspect we may have a bit of a mystery on our hands as to why it behaved properly today all right did they do anything differently because of the trajectory the first time uh we did we because we didn't understand the problem we corrected it halfway which is to say we told it to go up not just a little bit more shallow all right here we have astronaut voices let's pick up mission control well we are coming on uh acquisition of signal through the indian ocean station processing data now through indian ocean all right was that mission that was uh that was mission control we heard dan brandenstein will try to call columbia here configure aos we have you for six minutes there they are back in control they're calling you out back in touch with the mission control here and columbia i have a homes repellent pad uh the crossfit queue for you when you're ready to copy for your own stew getting a little feedback on this signal coming from space over the indian ocean would you believe we have about six minutes uh remaining on this path go ahead okay uh for your cue card it's the crossbeat queue it's uh what they're talking about is coming up on an orange burn this will be another burn of those onboard rockets to put it into the final perfect orbit they're hoping for and uh al dale recently uh put together a uh piece for us that explains to us exactly how these ohms burns work in space so that we get into the proper orbit that the shuttle is looking for the two orbital maneuvering engines are located in separate pods which rest on

[01:04:01 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3841s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3841s)

located in separate pods which rest on either side of the columbia's aft fuselage these engines provide the thrust necessary to insert the columbia into final orbit to alter the orbit as required and to slow columbia down for re-entry into the earth's atmosphere each engine provides about six thousand pounds of thrust only about an eighth as much power as an engine on a 747 they can be reused on at least 55 shuttle missions without a major overhaul and then 55 more times they make the shuttle a working space vehicle a manned machine that can maneuver within limits where it wants to thank you aldale we're now back at uh houston listening to mission control talking with the astronauts now over the indian ocean our transmission at the moment uh i've got to give joe allen credit for this although i'm going to steal it from him uh they'll be crossing the international date line in just a moment so uh truly is almost truly certain to have the shortest birthday on record history mission control here in houston back in touch with the shuttle astronauts as they're preparing now for that final ohms burn which will come in just a couple of minutes uh hoping to put the shuttle orbiter into a final and perfect orbit to make it a full goal for the five-day mission everything so far going just beautifully and our coverage of space shuttle columbia continues in just a moment reach into space abc news live coverage

[01:06:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3960s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=3960s)

reach into space abc news live coverage of the space shuttle columbia continues now from the kennedy space center in florida frank reynolds okay we're back here at the kennedy space center where uh nothing much is happening because it all happened some 47 48 minutes or so ago when colombia lifted off and is now on its way uh in orbit and proceeding very satisfactorily gene cernan to say with me and gene i uh noticed we just received a report on the heartbeat so it's kind of interesting angles uh 110 up to 120 at launch and uh dick truly's 86 up to 94. well it reflects a couple things i believe their enthusiasm and also uh the responsibility of the commander he's got to make some decisions as to whether or not they may have to abort and it's his decision his decision loan if if there's no other time to discuss it with anybody else he does have the added responsibility sure yeah but there's a guy's flowing into space in the in the x-15 16 times and he still responds so it's always a first time it's never routine he's the veteran and yet his heartbeat went up a little more rapidly and more steeply than did dick truly but you could hardly call truly a rookie though oh in terms of space flight of course they both are aren't they really of actual orbital flight this the heartbeat i've always felt doesn't necessarily uh indicate apprehension either it's it's enthusiasm it's it's it's it's they're ready for this and they're there and it's an exciting thing like a young kid going on the merry-go-round what was the what was the difference between yours on your first launch and the next time you went up you recall i think they were as high as they could possibly go each time again each time was always the first time for me uh the first time i ever flew i think they could have strapped me in blindfolded i would have gone i was a little bit more aware what was happening in the second third time but that heart rate responds to what's going on and i don't recall exactly but i know it was an area that joe's probably 110 115. well they've got quite a bit to do today and they still have a long day of activity ahead of them actually about uh oh see

01:08:02 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=4082s)

actually about uh oh see it's about 35 minutes or so we should be getting getting the first television from the spacecraft when they will show us what is not necessarily the most exciting television perhaps but it will be the opening of the payload bay which is uh vital to the success of this mission because uh get the payload bay open then of course they will be able to extend the arm because they got to keep the doors open most of the time during the mission anyway dr well there's some cool thermal requirements on keeping the doors open of course the main mission of the of the shuttle once it becomes operationally is through the use of that payload bay and those doors must open and close with a great deal of routineness great deal of confidence of course that's where the the the the arm the manipulator arm is located uh that we've talked so much about all right for those of you who have just joined us we'd like to reset the scene once again as best we can we are a little more than 50 minutes into the second mission of columbia the space shuttle and here you see it over the indian ocean uh moving along down toward australia they're probably just coming into their own night time the night time that we won't see for maybe another eight or ten hours the sun is setting uh they don't have the advantage of seeing the beauty of that sunset because it's it's behind them and they're going forward but they will see the beauty of the sunrise okay let's replay now for those of you who uh may have missed it the uh the launch of uh columbia 50 minutes ago from the other direction there go the liquid engines on the shuttle and then here we'll come there's the solid boosters you can hear the crowd that launch is a great equalizer for for for commoners and kings alike oh sure gene and frank yes jules go ahead it was a spectacular view from here uh

01:10:02 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=4202s)

a spectacular view from here uh you know we actually could see these solids ignite and liquid uh liquids ignite on the solids have been ignite you could uh oh sure uh we're forward most uh camera position here and whereas the the uh crash site is blocked out by the rss the rotating service structure we are not here's another here we're going to see it replay it again yeah sure this is for camera uh atop our abc camera position here that's a little bit better picture than we had when i was out there with you because it wouldn't lose some of the smoke away gene you know i've see i've seen and covered co-acted every one of these man's whites and my heart was really within this morning it was spectacularly clear and of course it didn't matter whether you know joe angle closely the way i do or dig truly just a little bit the way i do uh they were our guys and they were going up to do it and it was a very emotional moment jill's uh you know we all know it makes a difference where there's people on top whether it's a piece of hardware whether it's got life in it on it life is part of it makes a big difference well another part that made it most interesting gene was joe angle's unflagging modesty and sense of humor when they landed back here the other day he cheated with our photographer saying i better get it right this time it's the last chance you're going to have jules that plume of smoke we see from the solid rocket boosters is over 700 feet long and that's uh perhaps five times higher than the booster itself the acid missed cloud if you want to call it that blue right over our camera site gene so that's one thing you missed by being inside with frank you've missed being well i wonder uh gee what a shot we'll see probably very

01:12:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=4320s)

gee what a shot we'll see probably very shortly the solid rockets shut down and and it is very critical uh that they both depart separate depart at the same time it almost it almost looked like an animation you know the first uh television from the spacecraft will occur in about 30 minutes or so when they will open the payload doors and uh that will be very important of course because on this mission they are going to demonstrate uh the capability of the arm the canada arm that is made by the canadians and uh is on board this time that's of course a very integral part of the space shuttle because eventually the shuttle is to be sort of a delivery truck to take things up and if necessary bring them down and the arm will be used quite extensively on that but however one of the interesting things about the opening of the payload bay doors or the cargo bay doors is that when that happened on the first launch last april uh that's when we first discovered that there had been some loss of tiles remember there was quite a bit of concern about that gene about whether the tiles would actually survive and uh stay intact so that they would be able to complete the mission and land all right well i think that's one of the things we're going to be looking for very closely uh on this mission again is to see whether we were able to find where those tiles are critical and find out if we solve the problems with losing those first few tiles there's going to be other problems like that as we go along with the program until we build up a system of spacecraft where those things that may have some failure patterns in them early will truly last for 40 50 flights into the future well the payload bay doors must of course uh open and uh they must be able to close them too in order to bring them down and steve shepard has prepared this report on the importance and the process of the doors in the cargo bay steve the cargo bay doors down the back of the orbiter columbia are a surprisingly complex and critical part of the shuttle spacecraft they aren't the kind of doors you find on the side of a boxcar for one thing they are very large each of the doors is 60 feet long and 6.7

[01:14:02 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=4442s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=4442s)

of the doors is 60 feet long and 6.7 feet wide and weighs as much as two compact cars they are made not of titanium or some other exotic metal but of a graphite epoxy material a sort of sophisticated plastic which is both lighter and stronger than metal attached to the inner side of the doors are four giant radiators when the shuttle reaches orbit the doors are open to expose these radiators and allow them to vent off heat into space so much heat builds up inside during launch and from the electronics on board that the doors must be opened and the radiators exposed or the shuttle must be brought down by its fifth orbit conversely the shuttle cannot land unless the doors are closed the doors are operated by an automatic system commanded by the spacecraft's computers but should the automatic system fail they can be opened and closed by hand the astronauts train for this contingency underwater which simulates a weightless state in space an astronaut would have to don a spacesuit and enter the unpressurized cargo bay at the bay's aft wall he would attach a kind of large socket wrench to an exposed fitting and crank the door's opener shut using muscle power if it were necessary the astronaut could also inspect the doors either by traversing the inside of the cargo bay or by moving along the outside surfaces of the doors which are equipped with handholds in principle doors would not seem an especially sophisticated part of any spacecraft on the shuttle they are yes the simple opening and closing of a door becomes a very very important uh function we are about half an hour away now from actually opening the door on board columbia and for more on that now we want to go to the johnson space center in houston and steve bell steve frank uh the astronauts play an active role in this activating of the cargo bay door in fact they're getting out of their seats for the first time on this flight now that they are in their uh orbit for a five-day mission and uh joe allen is sitting here with

[01:16:01 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=4561s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=4561s)

joe allen is sitting here with uh the knowledge of someone who's first hand gone through all this in the simulator how difficult is it to get unstrapped get out what are they doing exactly steve there's a a very real difference between simulator and what joe and dick are going through now though because gravity's been turned off and so for the first time for any length of time the two of them are now weightless and one senses that as the straps are taken off you unbuckle your your seat belt so to speak and suddenly you're not in the seats anymore but floating and so right now they for the first time are floating out of the seats and they will float to the back of the flight deck and it's from that point that they will open the doors they look back out through windows the same view that we'll get using their television cameras and uh open the door from that vantage point and it reminds me that uh on the first space shuttle mission when young and crippen were up there uh young looking at the view of the earth that he had for the first time in that uh way said a little bit of this could last you for about six months uh all right so both men have to get out of their seat they have to get into position for the opening of the door and it's probably worth pointing out here that if they don't get that door open they've got a major problem because too much heat will build up in the capsule and uh they might have to go back into the unit uh in and actually have to work with that is that true partially true actually if we could not open them we'd think twice about staying for very long we'd come home and fix it there we're confident enough of the doors now that we're not going to do it deliberately like we did the first time though we're going to basically do it automatically right again when uh young and uh crippen were up uh the payload

payload doors they said kind of hesitated before they opened fully and it was crippen who said he was mighty glad to see the doors go ahead and open smoothly because he didn't particularly care about the thought of going outside

[01:18:01 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=4681s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=4681s)

about the thought of going outside trying to do anything associated with them so we'll be waiting for that to come up and we'll also have some information for you on what's inside the cargo bay the payload for this mission the first scientific payload and we'll continue our coverage of the space shuttle columbia in just a moment [Music] [Applause] and continuing our coverage of the second launch of the space shuttle columbia it is now in orbit it is almost completing its first orbit in fact and it's getting about ready time for the payload bay door opening exercise a very critical maneuver that's going to take place here we have a simulator of the mock-up in fact of the space uh shuttle at building number nine here at houston and uh it gives us a view of exactly how the doors will look when they're opened up the payload bay doors but of course this time we have a scientific mission involved and we have a cargo in the payload bay doors lynn shurer has uh been investigating exactly what went into this mission in terms of the cargo and the payload bay door and she explains to us now what's in there and how it's going to be used how does lightning affect the intensity of thunderstorms how much water do dwarf sunflowers need to grow in zero gravity where is the ocean its greenest and thus best for fishing to find answers to some of these questions nasa's osta one the office of space and terrestrial applications is sending seven experiments on board the shuttle osta's 11 million dollar experimental package is one of the most important aspects of colombia's second mission most of the experiments were

[01:20:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=4800s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=4800s)

most of the experiments were specifically selected because of their need to face the earth this is a model of five of the experiments and it will be mounted inside the payload bay of the orbiter just like that and since the columbia will be orbiting in this attitude for 88 hours of the mission the experiments will have plenty of time to collect their data from the earth the most elaborate will use a 30-foot antenna looking out the side of the orbiter to create a topographical map of certain land areas our related project will look straight down to identify certain rock types that could indicate hidden mineral and petroleum deposits like almost all the osteo1 experiments these will be controlled by ground personnel in houston and they're more concerned with working out methods of gathering data than with actual practical results the ocean color experiment will detect algae-produced chlorophyll on the surface of the seas as a means of determining environmental conditions and concentration of food fish another experiment will collect data on the amount of carbon monoxide polluting the atmosphere and there's even one that will try to develop a sensor that can distinguish between various features the difference between snow and clouds for instance well those five experiments are located back here in the cargo bay area two others are located in the front of the craft with the astronauts containers like these will hold seeds of dwarf sunflower plants with varying amounts of water in each to determine the best soil moisture for growth in zero gravity and finally in the only experiment to be performed by the astronauts themselves this camera will photograph lightning by day and by night to try to determine how electrical discharges affect the violence of a storm and to determine lightning's role in predicting severe weather conditions like all the experiments it's a milestone for space scientists so now what you're looking at is the

[01:22:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=4920s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=4920s)

so now what you're looking at is the payload bay arm that's going to be activated not at this first test of the door opening but later in the mission it's going to be given a test workout uh joe allen this is something that uh the pilot as i understand it actually is the operator and has a great deal to do with this indeed he does the the robot arm is in many ways a robot but it's in other ways an extension of the arm of the person that's working the controls how much practice time is going into the operation of that arm a great deal of practice now although as we learn to use it i think it will require less and less because it does react almost as one

one's own arm might react well it almost makes you think of these video games are you talking about buttons you push push button one and it moves up and right or steve i think it's fair to say that the best training for future astronauts might be the video games as opposed to learning to fly airplanes but the arm then will be given a test on this mission not to actually go out as and reach outside uh as i understand it but what will be the limitation on the test it will reach around uh in many places i'm not sure how much i guess it'll reach outside but they didn't want to latch it on to anything we're a little bit a bit afraid to exercise the fingers so to speak too much right now we uh we'll practice moving the arm and the next the next flight we'll we will go up to something and grab a hold of it so we're coming up now in less than 20 minutes on the first opening of the payload door test and uh as we've said this is a critical maneuver we've got to get those payload bay doors open in order to let the radiators out these are radiators that are necessary to give off the heat that builds up that's generated inside the spacecraft from all the multiplicity of equipment in there as well as the heat that comes from the sun on one side

[01:24:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5040s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5040s)

heat that comes from the sun on one side that's an interesting thing that we haven't talked about the temperature here uh you've got a vastly different set of temperatures on one side of the spacecraft as opposed to the other uh correct we tend to think in terms of temperatures here on earth what's the temperature of the air there is no air in orbit and so temperature has a bit different sort of meaning it's it's very hot on one side of the spacecraft where the sun's shining it can be very cold on the other side so what do you do do you leave the same side of the spacecraft in the well heat all the time we want that side warm we can certainly do that in this case the the orbiter is going around the earth it's looking down at the earth so that those doors are pointed down towards earth and the crew can look out over their from their overhead windows above them in a manner speaking and see earth below and it will be their first really spectacular view of the mission uh before he took off richard truly talked about the mechanical arm that it's going to get its first test that was in fact built by the canadians and uh he is the man who's going to be in charge of operating it on this mission the arm is attached to the orbiter uh just outside this window and on the port side lingeron uh it has uh two joints or by joint i mean a freedom of movement in the shoulder one we call shoulder pitch and the other one shoulder yaw moving out from the shoulder to what we call the elbow joint there is one one joint in the elbow which is elbow pitch moving out to the wrist we have three joints one is uh wrist roll wrist pitch and wrist yaw so the combination of shoulder pits shoulder yaw elbow pitch wrist y'all wrist and wrist roll make it just like your arm it can reach into the far reaches of the payload bay and eventually will to grapple a payload and

[01:26:02 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5162s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5162s)

eventually will to grapple a payload and remove it and put it into space or to retrieve a payload or satellite say that's been broken that we'd like to retrieve bring home and fix it and save ourselves a lot of money astronaut richard truly talking about the mechanical arm and if there's just a touch of pride in his voice well it's deserved because he's not only the operator on this mission he's also helped to design it he's been very uh closely involved in the development of what will be extremely important because of its duties later on when these are working missions and it'll be putting satellites out into space and picking up satellites and other things in space and bringing them into the spacecraft for a trip home later our coverage of the space shuttle columbia will continue in just a moment [Music] we are back now at the kennedy space center this is frank reynolds along with gene cernan and columbia the space shuttle has been off the pad now for one hour and 12 minutes and 20 seconds we don't have to be quite so precise anymore because we got past that magic 31 second mark that stopped us last week and i must say gene it was a relief to go right by that see everything just proceed right on as planned all the last minute glitches and worries and even the transcontinental shipment of a part from a spacecraft that is still under construction that's the challenger isn't it out there at palmdale well we made a next another major step into the testing of this vehicle so it can truly become operational as we hope it will the spacecraft is out of touch right now they're over well the southern pacific passing over at the moment some pretty exotic territory i gather uh the uh they're over american samoa well they passed the simone islands and that's a familiar place to me because that's where i recovered on two of my flights and uh very difficult for them to see those islands

[01:28:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5280s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5280s)

difficult for them to see those islands uh of course they're still in darkness over there as a matter of fact they'll be coming across the equator in about another oh seven minutes i believe and starting what uh we term as their second orbit around the earth and when they come over the united states for the first time they'll come in actually across mexico won't they southern across the southern tip of baja california central mexico probably just a little north of houston if they're on a track that they plan to be on out over northern alabama georgia and across the atlantic coast somewhere around north carolina what if they'll be able to see this place oh yes they will oh certainly oh certainly from uh from 130 miles up uh just a few hundred miles north they'll be able and they'll be looking for it too because that's you always like to look where you've been all right now it might be interesting i'm sure it would be interesting to you to see where you might see it tonight uh if you're in honolulu fine fort worth austin texas san antonio texas and petersburg florida miami just keep looking up in the sky but if you know the right time the right place to look uh with the size and the reflective capability of the uh the space shuttle uh i think it'd be very easy to see and it's exciting to see a star it almost looks like a star going through space and you know what it is do you remember going out and seeing sputnik oh i do i do sure across the heavens that reminds me the interested observers of course that the everything that takes place on this mission will be the russians who don't have a shuttle but are working on one they do have a space station of course and that reminds us that uh the shuttle while not a military weapon in itself does have military significance because it can carry weapons into space and it can carry other things that are important in the military sense our pentagon correspondent john mcweathy has prepared a report on just how the shuttle might be utilized by the military which is of course very interested in it and has expanded a considerable amount of money on it here's his story long before america's first space shuttle roared off the launch pad the soviet union was secretly working on a few surprises of its own

[01:30:01 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5401s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5401s)

a few surprises of its own it wasn't long after colombia landed safely at edwards air force base that intelligence sources began detecting a bustle of activity at russia's launch center in turkistan in june the soviets launched a cosmos space vehicle different than anything the west had before seen from verbal descriptions artists have pieced together the picture of a spaceship with more than half a dozen docking ports and mysterious pods on the outside that could cover some type of weapon intelligence sources speculate that the russians may be preparing to man this complex continuously adding more and more modules to make it seem more like home keeping a man in space at all times this would allow the soviets to conduct military experiments to have continuous military surveillance of the earth and to man and fire weapons from orbit this is america's saturn v rocket the biggest in the world it carried the sky lab into space in 1973 there is evidence the soviets are now building an even bigger booster and no one is certain exactly why this is the runway at cape canaveral where the u.s space shuttle someday will land intelligence sources say the soviets are also building an oversized runway again no one is certain why unless they are building a shuttle of their own intelligence sources say the success of america's first base shuttle flight and its obvious potential for military uses has not been lost on the russians nor has the fact that the shuttle program has been kept alive by pentagon interest and the shuttle vehicle itself modified to meet military requirements its 15 by 60 foot cargo bay for example is bigger than nasa wanted and high maneuverability was something else upon which the pentagon insisted giving the shuttle the ability to change its orbit laterally by more than 1100 miles thus allowing it to avoid landing at unfriendly airfields in an emergency the air force is building a launch and landing facility at vandenberg air force base that is just like the cape canaveral complex in addition to vandenberg the air force

[01:32:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5520s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5520s)

in addition to vandenberg the air force is building its own mission control headquarters that will be located in colorado near the norad early warning center in its earliest operational stages for the next five to eight years the shuttle will be used by the military primarily as a way to get defense satellites into orbit and if necessary to bring them back for repair but the uncertainty over whether the shuttle will perform as advertised has caused the military to keep its old booster rockets in readiness should they ever be needed 10 20 even 30 years out the shuttle mission will change by then it could be used to carry weapons into space weapons already under development in the early 1970s the air force used the invisible beam of light from a laser to shoot down an unmanned airplane now they've mounted a more powerful laser in a converted transport all the while laboratory tests continue coming on wind tunnel coming on [Applause] the target titanium the tough lightweight metal used in fighters and missiles the laser mounted aboard the shuttle could be used in the vacuum of space to intercept soviet intercontinental ballistic missiles on their way to targets in the u.s lasers in space in theory could wipe out the soviet icbm threat the real use would be as an anti-ballistic missile defense system so that you could destroy in the boost phase shortly after liftoff submarine launched or intercontinental ballistic missiles it also can be used to destroy aircraft flying at high altitudes such as bombers carrying nuclear warheads toward the united states barring some sort of treaty that would keep all weapons out of space most experts at the pentagon believe the space shuttle will become an increasingly important tool for national defense a tool that could change forever the way wars are fought on earth thank you jack well looking at the beautiful uh blue sea there it's kind of hard to think or even to recognize that one day

[01:34:01 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5641s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5641s)

think or even to recognize that one day this thing might be used in a military sense but i guess uh i guess it can be and it certainly does have a military capability as jack mcqueady pointed out well it's got a military potential certainly frank i don't think we as a nation can afford to bury our head in the sand and and ignore the potential uh while other nations are exploiting the potential of space tell me uh gene you were uh you were one of the few i gather ever to visit the soviet uh launch facilities at baikonur how did that come about well there were only 11 of us i think that included charles de gaulle 11 westerners he was not there when we were there of course but 10 of us working on apollo soyuz flight uh insisted and after a great deal of effort on our part were allowed to go to the uh to the launch side of baccano where the soviets do launch their their uh their spacecraft and their boosters uh we uh were given many reasons for going in at night and coming out at night but nonetheless we were there and we did see a great deal did they answer all your questions no they did not answer all our questions they they answered them in our own way but uh they knew we were smart enough to know that they weren't giving us the straight answers i was in moscow i know for the apollo soldiers mission and we made the pro forma request uh knowing of course that it was going to be turned down you know we'd like to go out to baikonur and see your launch facilities and the answer i guess was something like not possible and that was it and yet you know we we sit here we watch all of our flights we the world this this country certainly but the entire world all of our apollo germany all the flights before that now the shuttle flights they the first flight they ever televised was the apollo soyuz and that was because we forced that on them if you will that's the first flight their people their own countrymen have ever seen or participated in that bit of history went right on through the soviet soviet period they always waited until the up until apollo soyuz in the 75 they always waited until everything was all set before they showed any replays of the of the launch but i guess yes you're right that was the first time that they actually left the soviet tv

[01:36:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5760s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5760s)

actually left the soviet tv uh show it live and that was primarily because it was also to be shown in the united states at the same time well they do have a dedicated dedicated effort to permanent presence in space and this is something i think we have to acknowledge they recognize that the existence of space is to be used certainly and hopefully peacefully but nonetheless like the oceans like the seas we have to consider all those possibilities that may be needed to defend what we believe in well speaking of the television uh we're going to have the first television from columbia in a few minutes uh about three or four minutes uh 13 minutes rather yes about 13 minutes or so from now uh yes at about 1 35 135 minutes or so into the mission and then we'll see the payload doors open and we'll have a chance to inspect and see whether there's been any damage to the tiles and so forth and we'll have all that when our coverage of the mission continues after this word from our local stations reach into space abc news live coverage of the space shuttle columbia continues now from the kennedy space center in florida frank reynolds and uh good morning once again it has been indeed a very good morning for the astronauts of apollo of apollo i'm going right back because i'm sitting here with an old apollo veteran for the astronauts of columbia the space shuttle gene cernan is with me here and it's been a very good morning as i say because everything has gone well the initial countdown of course was uh set back uh two and a half hours or so but then when they said ten o'clock it turns out that they meant 10 o'clock and it lifted off at 10 10 just a very brief delay in the final countdown procedures and since then everything has gone well we're still waiting right now for the uh signal to be picked up once again from the astronauts as they

[01:38:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5880s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=5880s)

from the astronauts as they begin to approach the united states here you see where they are they're over the pacific now and coming up on the southern coast of uh mexico and they'll be moving in over the united states shortly so let's go now to where they're tracking them very closely at the johnson space center in houston texas and steve bell steve thank you frank and as we track the mission as it continues toward the end of its first orbit what we have is a familiar gremlin that's come back again we've talked so much about the apu's the auxiliary power units the three of them that are on board it was problems with their oil filters and the cleanliness of the oil that caused the first delay a week ago and uh as you may recall astronaut joe allen sitting here with me was telling us earlier that one of them had heated up a little too much and had to be turned off early now it turns out we're having a problem with another of the three apu's joe what's exactly happening here we have three on board imaginatively named apu one two and three and uh the third one uh dick truly shut down a bit early because it was getting too warm when we went over australia we noticed that apu number one was not cooling down even though it was shut off it was not cooling down properly we think maybe some heaters are stuck on and we've we've turned off all heaters to that particular apu and we will anxiously look at what the temperatures of the of that apu are when the spacecraft is acquired coming over california all right now what does this mean to the mission uh could we could we at all be in a configuration where they'd have to come down early i think not though we have three we can lose one and still be comfortable we're not in danger of losing this one but i wish we had heard the last of the apus apparently we're going to hear a bit more about them as we look at the possible heater problem is it accurate then that if they can't correct this problem uh they could shut this one down for the re-entry and simply come down with the use of two

[01:40:01 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=6001s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=6001s)

and simply come down with the use of two apus yes it is shut down now we just won't start it for the re-entry if for some reason we think it is not operating properly this is not the one that overheated initially the that's correct all right now this is what we've been talking about all along by redundancy uh in effect is couldn't you lose two of the three and still have the power to maneuver the rockets that have to get you back into the deep deorbit that is exactly correct the philosophy design philosophy of the space shuttle is to be able is is based on we can lose one system one of anything and still operate in fact not even be worried when we lose two systems of anything then we're concerned and think seriously about coming home that is true the ap okay so as uh the orbit comes back over the u.s we will definitely be hearing i'm sure ground control here in houston and the astronauts up in space over the u.s talking about the problems with the apus and how to deal with it and our coverage of space shuttle columbia continues in just a moment [Applause] continuing our coverage of the abc news coverage of the launch into space of the space shuttle columbia in fact we really haven't stopped to emphasize the fact that the major accomplishment of this mission has already happened they have sent a used spacecraft back into space successfully it's now in what we know as much as we know now to be a perfect orbit for the five-day mission all appears to be going well except with those apu's and we'll keep in touch with that it does not appear that an apu problem would shorten the mission at all at this time

01:42:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=6120s)

shorten the mission at all at this time uh one of the things coming up at four hours into the mission is the uh activation of osta one now that's the package of scientific experiments that are in the payload uh cargo area of the spacecraft the cargo bay doors to be open very soon now and once that's happened then they can activate the experiments one of the first experiments is called a feature identification file it's uh one of those experiments that can't be done from ground level it can't be done with the same effectiveness as it can from space at even the height of an airplane so the ground effectiveness or i should say the feature identification file is uh one of the first experiments that's going to be activated lynn sure has a report on how it's operating and it will be one of five experiments the fifth experiment in the payload bay and here is lynn sher's report [Music] file feature identification and location experiment this is a technology demonstration located in the shuttle's cargo bay file is meant to develop a smart sensor a remote device that knows the difference between various features clouds and snow or vegetation and ocean for instance it's a device that will be used in satellites of the future to eliminate data that's not needed well a practical application for this is really to control sensors in orbit so that we minimize the amount of data that we have to process and analyze on the ground file uses a cone-shaped sensor triggered by the sun to activate two television cameras one film camera a tape recorder and an electronics unit that will make decisions it will collect 32 scenes of any one cover class like land and when it has 32 land scenes stored it will no longer

01:44:01 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=6241s)

land scenes stored it will no longer collect any more land scenes it will move on and collect vegetation and in that way for instance if we had something like an aerial camera on board the shuttle it would only turn that camera on for instance where when it was over land that was not covered by clouds if we have this this kind of a sensor on board back at the johnson space center in houston this is steve bell with abc's continuing coverage of the launch of the space shuttle columbia and the columbia is coming back over the united states just crossing over the coast of california now and we're going to pick up the voices of the astronauts again let's listen roger they're on 8-12 and we'd like all three apu heater gas generator fuel pump switches off all right here we're getting instructions from mission control up to the astronauts referring to just exactly the problem we've been talking about the three apus joe what are they doing now it sounds as though they're turning off still more heaters these are different ones on the apu's and capcom has asked dick to go to the back of the vehicle and turn off the heater switches there now when you say the back of the vehicle you're now talking about the back of the no that's shuttle you're back back to the flight deck it's a fairly small volume there at the very front end that's right i know from my own simulator experience you don't have a lot of room in here but we're talking about a pilot now out of his seat working going to a control panel at the back and being asked to shut down uh more heaters in an effort to obviously bring down the heat in apu number one and we're the heaters are normally configured in an automatic mode that is to say when the temperature drops too low they'll come on the thinking is that even though they're in auto they one or perhaps more might be on all the time in other words stuck on

01:46:01 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=6361s)

the time in other words stuck on all right one of the things that we've been hoping for on this pass over the u.s was the first set of television pictures live television from the spacecraft could this apu problem jeopardize that by diverting the attention it's possible but but uh the procedure is to turn them off and and then joe and dick will go about business as usual well the problem is one for mission control to worry about more than the the astronauts on board yet all right well what what we hope to see is uh the first live transmission from the space shuttle columbia and uh it will be television pictures from onboard cameras that are going to be activated and hopefully will be activated on this first pass over the united states steve shepard has filed a report on exactly how those cameras are set up and what the plans are for the cameras during the mission and that's going to be providing us with uh our most exciting moments during the next five days steve shepard the space shuttle columbia flies into orbit with enough television cameras on board to outfit a good sized tv station there will be eight cameras in all two in the crew cabin four in the cargo bay and two attached to the remote manipulator arm the two cabin cameras are portable color models they are kept in stowage during liftoff and are unpacked for use by the crew only when the columbia achieves orbit astronauts truly an angle will use those cameras to give ground controllers a good view of exactly what's happening on the flight deck the four cargo bay cameras are located in fixed positions near the corners of the rectangularly shaped cargo area three of those cameras are black and white and will be used primarily to show the operation of the huge cargo bay doors and the movement of the remote manipulator arm the fourth camera will shoot color pictures and in addition to monitoring the cargo area will be the primary camera for showing ordinary viewers back on earth what's taking place on the shuttle mission the two black and white cameras

[01:48:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=6480s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=6480s)

mission the two black and white cameras on the manipulator arm will be used by the astronauts to guide the arms operation one camera at the elbow will monitor the arm's lower segment while the other camera at the wrist will act like a pair of extended remote controlled eyes with it truly an angle can actually look back at themselves from outside to colombia or even get a picture of the underside of the spacecraft together the eight cameras on board columbia will not only help the crew perform its mission more efficiently they will also give scientists at nasa an ordinary layman back on earth the best pictures yet of man working in space back at the johnson space center in houston steve bell with abc's continuing coverage of the columbia space shuttle astronaut joe allen sitting here with me you're continuing to monitor the transmissions okay i can't swing elsa around far enough to see it roger we're gonna give it a whirl and uh we'll let you know what they're talking about of course those three apu's onboard the auxiliary power units one of which is acting up i'm sorry they're now talking about problems with the color camera system so we have a second problem that we know of however this one has little or nothing to do with the actual flight it simply has to do with our ability to observe the flight and then uh any experiments joe directly involved with the television cameras not not really steve the uh experiments uh are instruments not cameras it is true though that the tv cameras give the engineers a lot of information added information in addition to giving us some pretty good views of planet earth and also deep space we have a number of cameras on board and we heard there joe tell tell lesson mission control

[01:50:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=6600s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=6600s)

mission control that he was having trouble getting one of the cameras to put a picture on a monitor they have a tiny little tv studio there not unlike ours here and can monitor what the camera is sending down to earth uh do we know yet one of the payload bay doors they are not open uh there's no massive hurry to get along with that they're trying to get the cameras set up but that has dropped now behind schedule on the uh i'm not sure they're behind schedule they're just trying to configure the cameras and the schedule calls for a number of minutes uh allotted to getting the doors roger columbia we see the verniers on reynolds uh listening in on all of this uh gentlemen any observations on these two problems we seem to have developing now well i think uh steve that uh joe has probably put it right that they're not really the apu could be a problem of course but as far as the television transmission and the opening of the payload doors they haven't really started to do that yet as far as the cargo doors are concerned is that right they may have a problem with the television because uh as joe engel reported he couldn't get a picture on his monitor there but didn't houston say that they were going to uh try to activate that uh from the ground of course the television can be important too gene i mean it would be nice to know about the tiles too wouldn't it well the tiles and they want to they want to monitor the doors on television because that's a very good the doors are still a very critical item and we want to get some very good engineering data from those televisions and and joe we're going to get some here we're gonna get some video now i believe uh some pictures there we go this is uh being shown at uh mission control in houston joe do you have any idea what this is i think it looks like a camera looking back at us uh let me think about this for a moment columbia houston uh we have no joy on uh turning delta on either we did turn on one of the apps once and it looks good and we're going to give you the cameras for your payload pay door work

[01:52:07 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=6727s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=6727s)

could not get one of the cameras working uh that joe couldn't get working also but they did turn on another one and this appears to be enough camera looking forward reporting that mission control was only able to command the camera on board therefore we will have no color television [Applause] does that mean now no color television for the mission i'm not certain i i think there are numbers of things to try well that would be pretty intelligent it looks like a color tv to me it sure does being returned right now just about one hour 41 minutes of time [Applause] no i don't believe they have at this point they have not opened the doors yet jane the uh lights we see houston uh be advised uh we have camera a on the flag and is looking great okay we have one of the color camera cameras on right now the light we see is from artificial lighting in the in the cargo bed [Music] what we're seeing is inside the cargo bag yes it's inside it's uh that report from columbia the field-like markings are difficult to see [Applause] channel controlled houston the 1 hour and 42 minutes fast elapsed time we have approximately uh four minutes and twenty seconds remaining over stateside

[01:54:05 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=6845s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=6845s)

it's very possible we won't they do want to get these cameras rigged up as i said they're not critical to open their doors but the data that we get from those cameras visual data that we get from those cameras is critical particularly if they have a problem with one of the latches and we still have four minutes or so before we signal apparently not uh i thought maybe we were going to keep the picture up and i have a fight you still have it up there and now it's gone now from houston too roger on that uh panel 812. let's listen to them uh they're just reconfiguring some some systems here now frank uh they are concerned with the apo you know i don't visualize any problems of any kind here at all i mean there's there's a little hesitancy on uh on on a parts of some but i really feel that this is just putting things in an orderly fashion in order to to proceed with the opening of the doors they're over in north carolina approximately over north carolina right about now maybe i should uh i should repeat that we did mention earlier some of the cities in the united states where you might be able to see the spacecraft if you happen to be in the right place at the right time uh miami fort worth austin texas let's see i've forgotten a few of the others but also general line houston yes and you say gene the best time would be at approximately sunset well when uh when you just go into darkness on earth and uh and uh something above you 130 or 40 miles is still in sunlight and you can see the reflection of uh say the shuttle oh in houston for instance it might be uh 6 6 30 uh somewhere in that period of time might very well be the best time to see the that'll be approximately they'll be in about the fourth orbit around that's about what it looks like

[01:56:00 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=6960s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=6960s)

looks like to me but uh when you're in darkness it's surrounded by darkness and yet there's sunshine and you've seen airplanes up there when the sun is going down and they're still in sunlight well this is this is even on a grander scope because it shuttles much higher okay well we'll be back uh to get that television if we do get it indeed and our coverage of space shuttle columbia will continue in a moment all right one hour and 46 minutes ago columbia the space shuttle lifted off from the now empty pad here at 39a at the kennedy space center at cape canaveral and is now well on its way it's already completed its first orbit passed over the united states but we've lost the signal now because they've gone out of range of the various tracking stations the television didn't quite work on the first pass around and they didn't open the cargo bay doors but all that is expected to take place and of course we'll be very closely monitoring this situation throughout the entire mission which will uh not end until next tuesday at uh 2 10. is it 2 10 eastern time yes i believe 2 20 eastern time in uh when it comes down in california so the mission is going very well columbia the space shuttle back in space for the second time with its crew of joe engel and richard truly and now i want to thank all those who've helped us here uh only a few by name steve bell and joe allen hugh downes at mission control in houston of course my colleague gene cernan here with me at the kennedy space center and also jules bergman who's been out there at our forward observation point enjoying this launch and making a great contribution to our broadcast so we'll have more on all this on abc's world news tonight for now this is frank reynolds at the kennedy space center in florida

[01:58:04 (https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=7084s)](https://www.youtube.com/watch?v=UcE9g8iZ3cY&t=7084s)

my this has been reach into space abc news live coverage of the launch of the space shuttle columbia this has been a special events presentation of abc news

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